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DIAGNOSTIC CHARACTERISTICS IN LYCOPUS

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(Plate 439)

DURING several summers of botanizing in Michigan the writer has noted the frequent occurrence of plants of *Lycopus americanus* Muhl. in which the pinnatifid or incised leaves commonly ascribed to that species were altogether lacking. Since this feature has been used almost invariably in the keys of our manuals as the sole character distinguishing *L. americanus* from its immediate allies of eastern North America it is not surprising that in herbaria we so often find the merely serrate-leaved individuals of this species referred to various other species. In attempting to find other diagnostic characteristics to supplement the traditional key character for *L. americanus* the pronounced individuality of its fruit became apparent as, indeed, did that of many of our other species.

It is remarkable that the characteristics of the nutlets in this genus (perhaps, for that matter, in the whole family) have received so little attention, particularly when we consider the importance attached to the morphology of the fruit in so many genera of the closely related *Boraginaceae*. And what study the nutlets have received (outside Penland's study of *Scutellaria*²) seems to have been largely superficial. Bentham,³ treating the *Labiatae* in DeCandolle's *Prodromus*,

¹ Paper from the Department of Botany and Herbarium of the University of Michigan, no. 577.

² Penland in *RHODORA* 26: 61-79, plates 140 and 141. 1924.

³ Bentham in DeCandolle, *Prodromus* 12: 177. 1848.

refers to them as "siccae, laeves, margine callosa incrassato trigonae, apice truncatae, basi attenuatae," and supplements this description with "nuculis majoribus minoribusve plus minus glandulosis." That the mature mericarps of most *Lycopodes* could be called "smooth" seems astonishing after one has examined those of any appreciable number of species. In the descriptions of the ten species which Bentham recognizes under the genus the fruit receives little further comment except for one species: of *L. arkansanus* he says "nuculis scrobiculato-rugulosis apice dentatis." This is surely a far cry from "smooth" and, indeed, is a better description of the condition prevailing in *Lycopus* nutlets as a whole than is "laevis." Briquet's description¹ "Nüsschen tetraëdrisch, mit verdicktem Rande und abgestutzten Scheitel, glatt") is essentially a repetition of Bentham's while Gray² and most subsequent American authors characterize the fruit even more briefly, the great majority, if not all, referring to it as "smooth." If this term is not often definitely misleading it would seem advisable that it be employed less unreservedly, at least, in consideration of the predominantly sculptured margin and apex of the nutlet.

In the following key an attempt is made to indicate briefly the characteristics of the fruit of the species of *Lycopus* native to northeastern North America. It is hoped that such a key may prove useful as a supplement to others based primarily upon floral and vegetative characters.

LYCOPUS

Lateral and apical angles on the dorsal face of nutlets much thickened to form a generally conspicuous ridge, the apical ridge entire, or thin- and undulate-margined, or thick and erose to tuberculate-margined; nutlets with the lateral faces (sometimes also the apical and dorsal faces) often more or less glandular-dotted.

- a. Ridge of nutlets entire, relatively soft and corky, conspicuous on all three dorsal angles; calyx lobes awn-tipped, rigid.
.....*L. americanus* Muhl. (Figs. 1-2).
- a. Ridge of nutlets not entire, generally less conspicuous or not at all evident on the lateral angles; calyx lobes blunt to acuminate, not, or but slightly, rigid....b.
- b. Calyx lobes deltoid or lanceolate, thin and blunt, not, or scarcely, exceeding the mature nutlets.
Top of nutlet smooth or shallowly rugose, glandular-dotted; apical ridge erose to tuberculate.....
.....*L. uniflorus* Michx. (Figs. 3-4).

¹ Briquet in Engler-Prantl, Pflanzenfamilien 4, 3a: 316. 1897.

² Synoptical Flora, vol. 2, part 1: 343, and 352-353. 1886.

- Top of nutlet, as well as apical ridge, deeply muricate; nutlets very asymmetric; fascicles broad, very densely fruited, the mature nutlets usually largely concealing the calyces. *L. virginicus* L. (Figs. 5-6).
- b. Calyx lobes narrow, acuminate, much exceeding the mature nutlets.
 Top of nutlet rugose-verrucose, the projections shallow; apical ridge scarcely evident; dorsal face of nutlet much broader than the lateral faces. *L. asper* Greene (Figs. 7-8).
 Top of nutlet verrucose to tuberculate; apical ridge well produced; nutlets (seen from above) more or less equilateral.
 Leaves sessile. *L. sessilifolius* Gray.
 Leaves contracted into a petiole. *L. rubellus* Moench (Figs. 9-10).

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NYPHAEAE TETRAGONA IN MAINE.—In August, 1934 when returning from an automobile trip through parts of New Brunswick and Nova Scotia, we stopped in northern Maine at Portage on Portage Lake. We took a small motorboat, with canoe in tow, across the lake and about four miles up the narrow Fish River, beyond Chase Brook. In botanizing that area in the canoe for *Potamogeton*, *Sarganium*, etc., I found a nice shallow bay, and noticed *Nymphozanthus microphyllus* (Pers.) Fern. and an equally small-flowered white waterlily. Most of the summer's collection was identified the following year at Northampton, but the white waterlily was put aside to be verified later. On one of my trips to the Gray Herbarium Professor Fernald identified it as *Nymphaea tetragona* Georgi, a species not mentioned in Gray's Manual. The plant is frequent in Asia, but has been collected at only a few places in North America: in Idaho, Ontario, Keewatin, and on Isle Royale, Michigan.¹

Specimens will be deposited in the Smith College herbarium and in the Gray Herbarium.—WAYNE E. MANNING, Smith College.

¹ Professor Manning's discovery of *Nymphaea tetragona* in northern Maine is most gratifying. A supposition that it occurs in the upper St. John waters is thus supported. The late Cyrus G. Pringle once told the EDITOR-IN-CHIEF of finding a tiny-flowered *Nymphaea* somewhere on the St. John system, during one of his trips in the 70's. Through the capsizing of his boat the material was lost, and Dr. Manning's is the first collection from the region to stand as a voucher.—EDS.